

Species Diversity, 2006, 11, 199–207

A New Species of the Genus *Amathillopsis* (Crustacea: Amphipoda: Amathillopsidae) from Japan

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(Received 26 August 2005; Accepted 30 April 2006)

Amathillopsis takashiaae, a new amphipod species of the family Amathillopsidae from Japan, is described and illustrated. This is the first record of this family from Japan. The new species differs from the known species of *Amathillopsis* by the combination of eyes being present and pereonites 1–4 lacking middorsal teeth.

Key Words: Crustacea, Amphipoda, Amathillopsidae, *Amathillopsis*, new species, Japan, taxonomy.

Introduction

The amphipod family Amathillopsidae was established by Pirlot (1934). Afterwards Barnard (1967) subsumed the amathillopsids within the Paramphithoidae, and Barnard and Karaman (1991) subsumed them within the Iphimediidae. However, in the revision of the Iphimediidae and similar families proposed by Coleman and Barnard (1991), the Amathillopsidae were revived as a distinct family mainly because of the well-developed gnathopods. In this study we follow Coleman and Barnard's (1991) classification.

Amathillopsis Heller, 1875 is the type genus of the family Amathillopsidae and has a cosmopolitan distribution (Wakabara and Serejo 1999). It currently contains 10 species from the world oceans, four species of which, *A. annectens* (Holmes, 1908), *A. australis* Stebbing, 1883, *A. grevei* Barnard, 1961, and *A. pacifica* Gurjanova, 1955, are known from the Pacific.

During a research cruise of TRV "Toyoshio-maru" of Hiroshima University to the northern Ryukyu Islands, southern Japan, in 2004, collections of amphipod crustaceans were made by Ms Yoshie Takahashi of Hokkaido University. One of these samples contained a species of amathillopsid amphipod. It proved to belong to a species new to science and is described herein.

The specimen was collected by beam trawl and preserved in 70% ethanol at the site. Appendages were dissected and embedded in gum-chloral medium on glass slides. The specimen was examined using a compound microscope equipped with phase contrast and Nomarski differential interference contrast optics, and it was illustrated with the aid of a camera lucida. The body length from the tip of the rostrum to the base of the telson was measured to the nearest 0.1 mm. The type material is deposited in the National Science Museum, Tokyo (NSMT).

The following abbreviations are used in the figures: A, antenna (1–2); B, body;

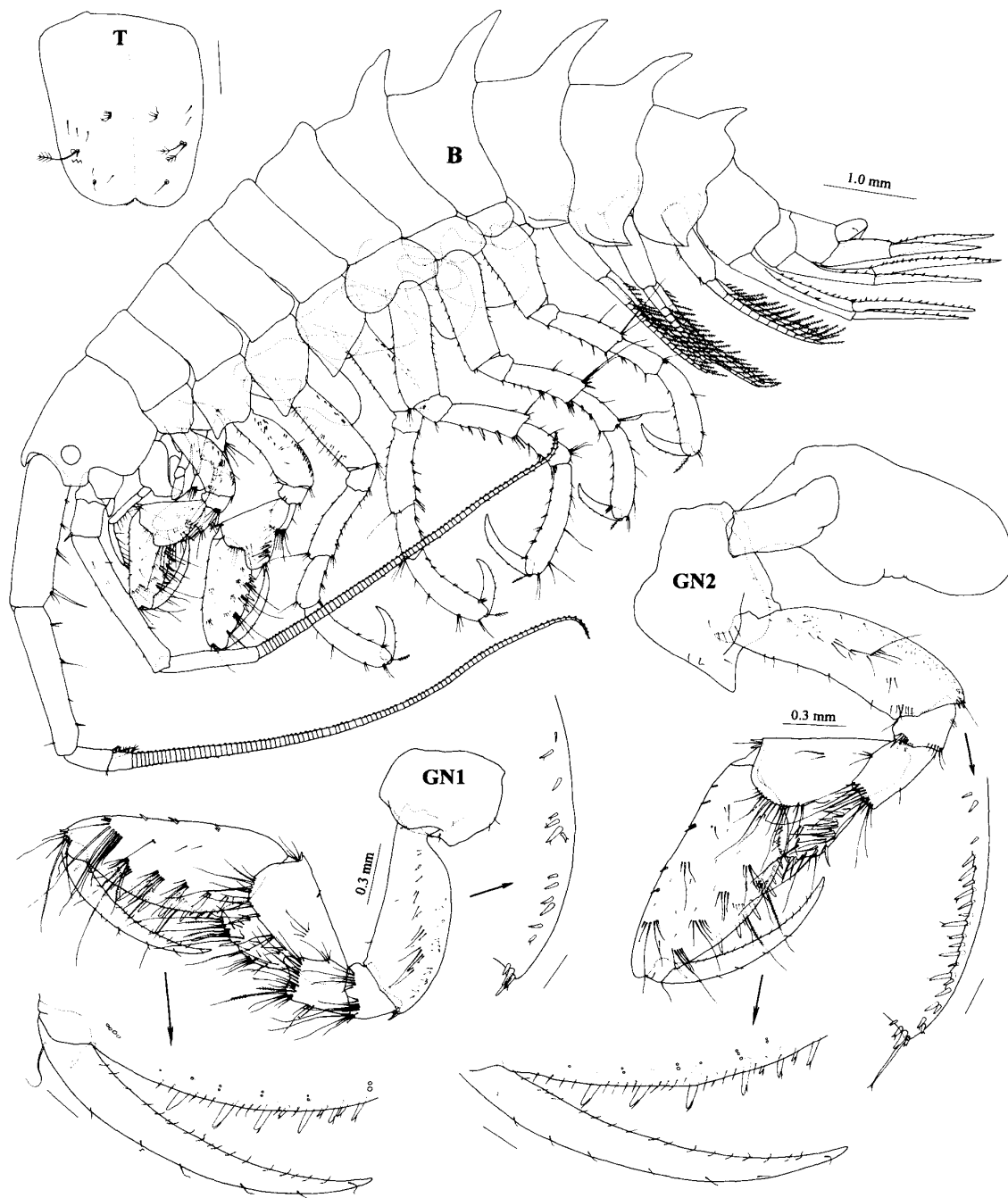


Fig. 1. *Amathillopsis takahashiae* sp. nov., holotype female, 9.7 mm (NSMT-Cr 16539). Setae are partially omitted in the details of GN1 and GN2. Scale bars=0.1 mm unless indicated otherwise.

FL, flagellum; GN, gnathopod (1–2); ip, inner plate; L, left; LL, lower lip; MD, mandible; MX, maxilla (1–2); MXPD, maxilliped; op, outer plate; P, pereopod (3–7); PL, pleopod (1–3); PLP, palp; R, right; T, telson; U, uropod (1–3); UL, upper lip. The nomenclature of setal patterns on the mandibular palp follows Stock (1974).

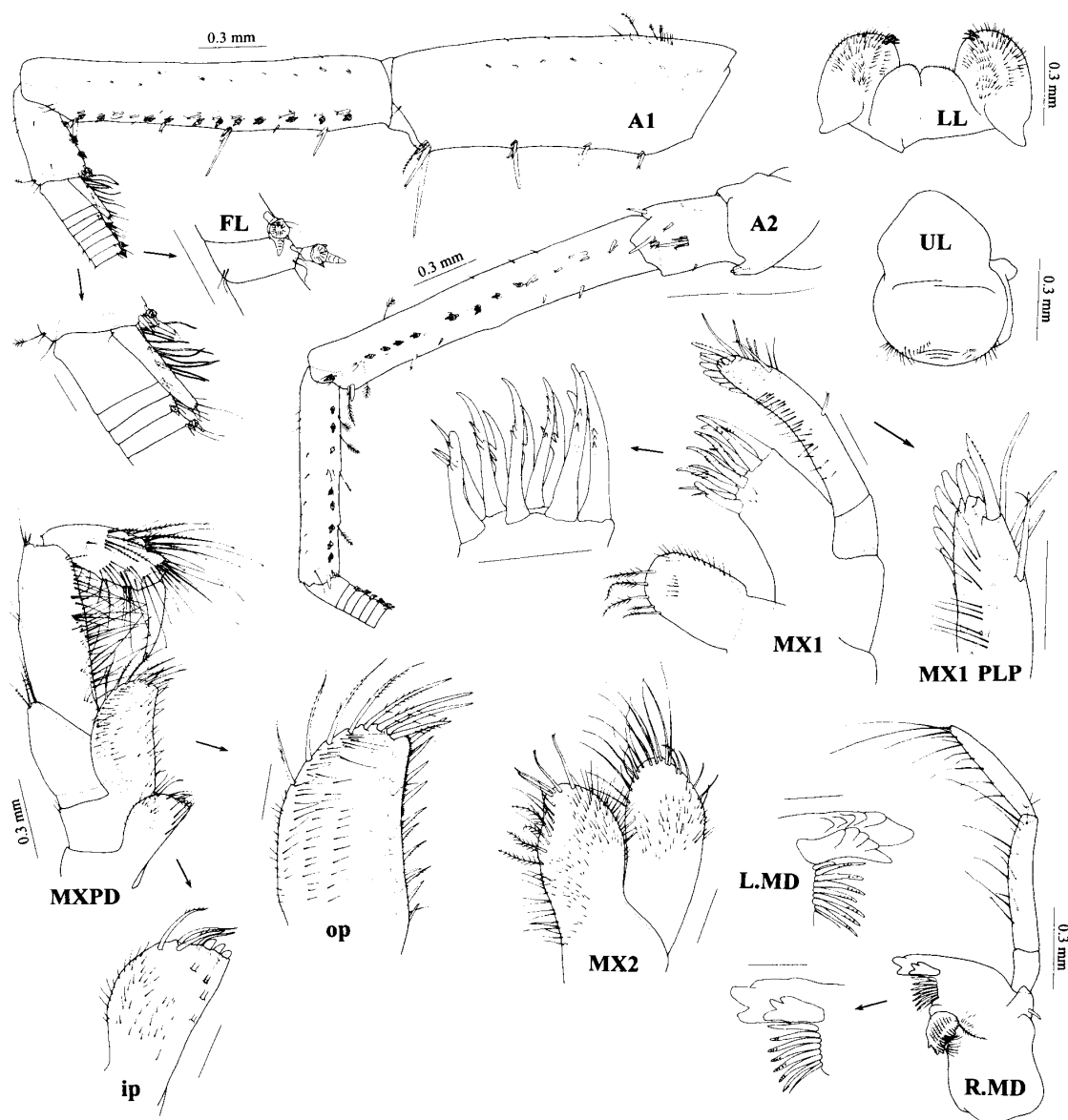


Fig. 2. *Amathilopsis takashiae* sp. nov., holotype female, 9.7 mm (NSMT-Cr 16539). Scale bars=0.1 mm unless indicated otherwise.

Taxonomy

Amathilopsis takashiae sp. nov.

[New Japanese name: Takahashi-ryukotsu-yokoebi]

(Figs 1–4)

Material examined. Holotype: female, body length 9.7 mm, NSMT-Cr 16539, TRV “Toyoshio-maru”, 2004-5 cruise, station 2, 32 km ENE of Cape Toi, Miyazaki Prefecture, 31°26.20'N, 131°39.84'E, depth 528 m, 18 May 2004, coll. Y. Takahashi.

Description of holotype. Head (Fig. 1, B) slightly longer than pereonites 1 and 2 combined, rostrum short, lateral cephalic lobe quadrate, eyes present, not

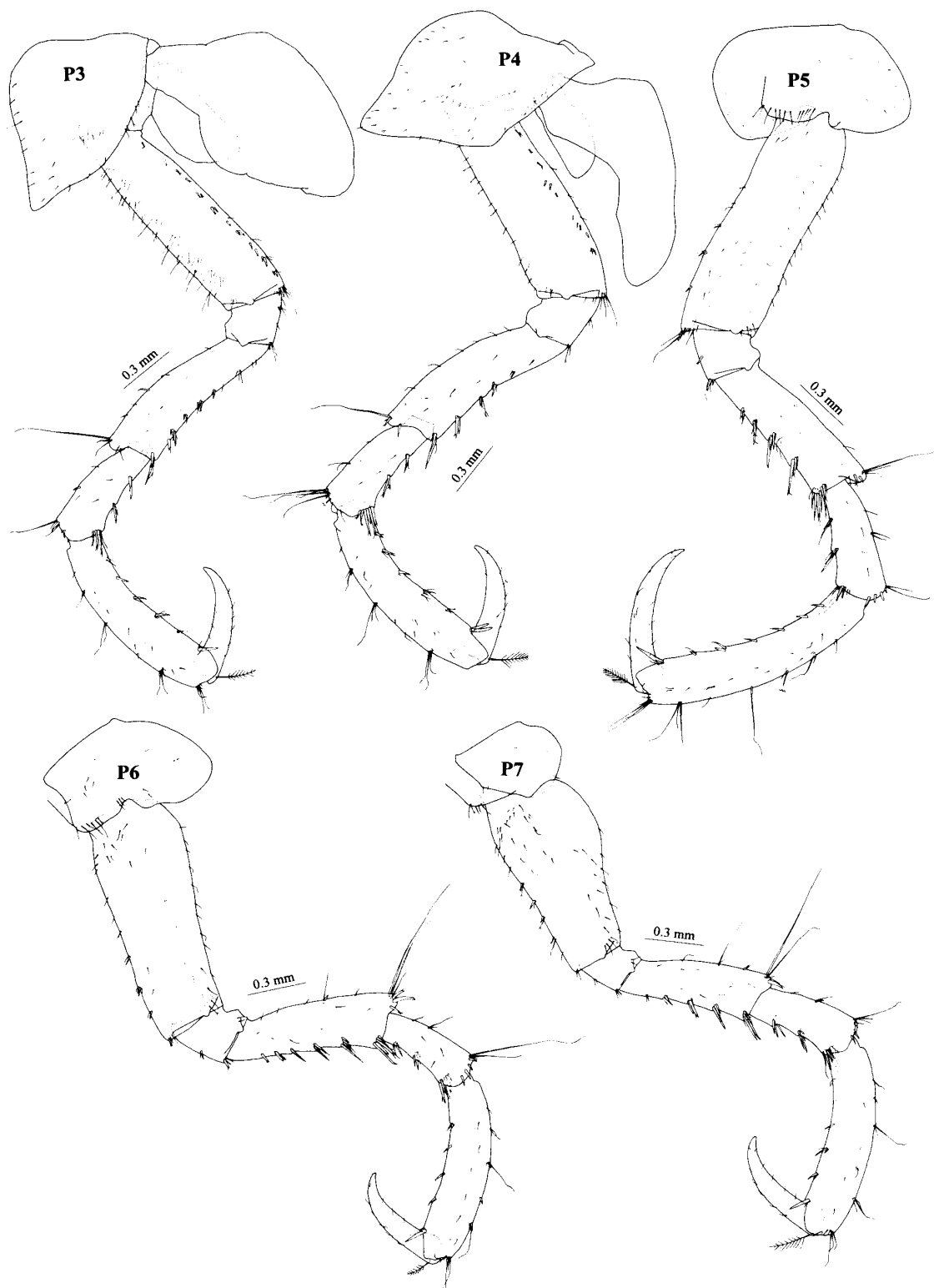


Fig. 3. *Amathillopsis takahashiae* sp. nov., holotype female, 9.7 mm (NSMT-Cr 16539). Coxal gills of P5-7 and brood plates of P5 were removed. Scale bars=0.3 mm.

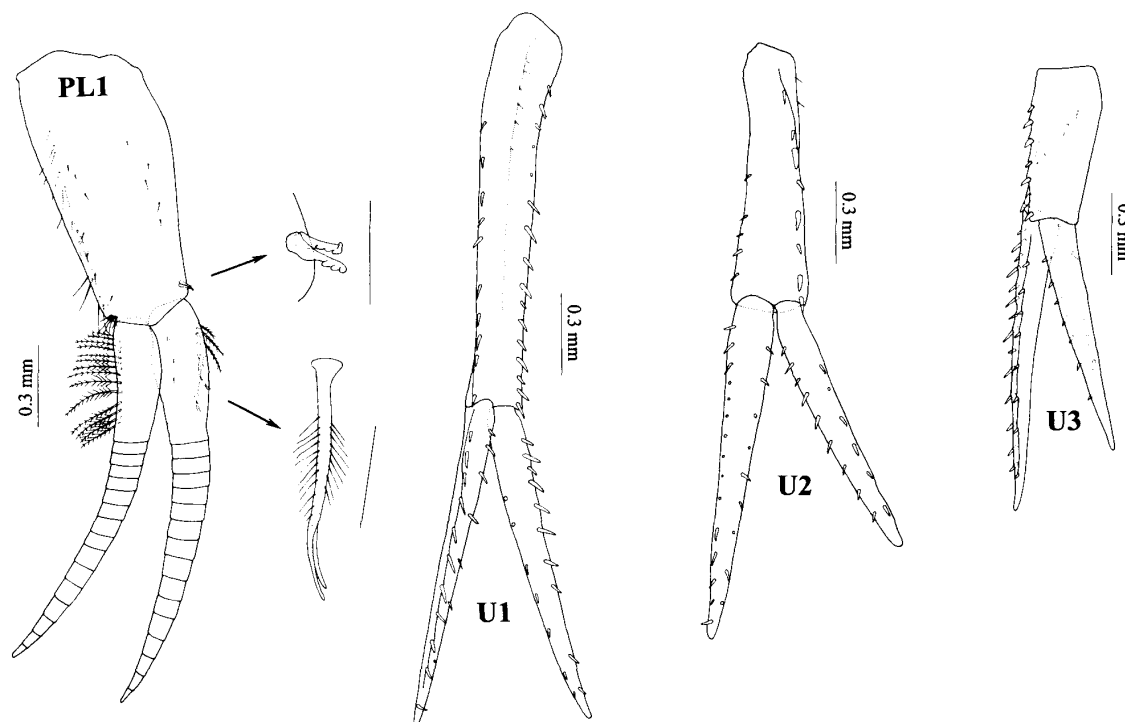


Fig. 4. *Amathillopsis takahashiae* sp. nov., holotype female, 9.7 mm (NSMT-Cr 16539). Most setae on pleopod rami are omitted. Scale bars=0.1 mm unless indicated otherwise.

pigmented. Pereonites 1–4 (Fig. 1, B) indistinctly keeled dorsally; pereonite 5 (Fig. 1, B) with short middorsal tooth; pereonites 6 and 7 (Fig. 1, B) each with long, weakly posteriorly curved middorsal tooth. Pleonites 1 and 2 (Fig. 1, B) each with long, weakly posteriorly curved middorsal tooth; pleonite 3 (Fig. 1, B) with short, weakly posteriorly curved middorsal tooth. Epimeral plate 1 (Fig. 1, B) with ventral margin truncate, posteroventral corner weakly pointed; epimeral plates 2–3 (Fig. 1, B) with ventral margin curved and posteroventral corner produced. Urosomites (Fig. 1, B) lacking dorsal armature.

Antenna 1 (Fig. 2, A1, FL) long, as long as body length, with peduncular articles 1, 2, and 3 in length ratio of 1.0:1.1:0.3. Article 1 longer than head length, its ventral margin with two clusters and one pair of robust setae; article 2 long, with ventral robust setae and 11 calceoli; article 3 short, with four calceoli; accessory flagellum uniarticulate; primary flagellum consisting of 104 articles, article 1 long, as long as articles 2–7 combined, each article with one calceolus. Antenna 2 (Fig. 2, A2) 0.8 times as long as antenna 1; peduncular article 3 reaching to mid length of peduncular article 1 of antenna 1; peduncular article 4 long, 1.7 times as long as peduncular article 5, peduncular articles 4–5 each with nine calceoli; flagellum about 1.1 times as long as peduncle, 76-articulate, each article with one calceolus. Calceoli of antennae 1 and 2 with discrete proximal cup embraced by broad lamellar receptacle, distal element with distinct transverse ridges.

Upper lip (Fig. 2, UL) with weakly convex apical margin, bearing two groups of setae. Lower lip (Fig. 2, LL) with outer lobes broad, setulose; inner lobes indistinct, fused. Mandibles (Fig. 2, R.MD, L.MD) with left and right incisors bearing six or

Table 1. Comparison of *Amathillopsis* species.

	<i>A. takashiae</i> sp. nov.	<i>A. affinis</i> Miers, 1881	<i>A. annectens</i> (Holmes, 1908)	<i>A. atlantica</i> Chevreux, 1908
Eye	present	?	absent	absent
Antenna 1, accessory flagellum	uniarticulate	?	uniarticulate	uniarticulate
Mandible, left incisor	6-dentate	?	7-dentate	6-dentate
Mandible, left racinia mobilis	5-dentate	?	?	5-dentate
Mandible, relative length of palp article 3 against article 2	0.9	?	1.2	0.8
Coxae 3 and 4	ordinary size	?	ordinary size	ordinary size
Gnathopod 2, ventral lobe on carpus	broad	elongate	broad	broad
Gnathopods, posterodistal lobes on basis	reduced	reduced	reduced	developed
Pereonites 1–4, middorsal teeth	absent	present	absent	absent
Urosomite 1, middorsal tooth	absent	?	absent	absent
Uropod 1, relative length of outer ramus against inner ramus	1.0	?	0.9	0.8
Telson	notched	notched	entire (pointed)	notched
References	Present study	Miers (1881)	Holmes (1908)	Chevreux (1908); Wakabara and Serejo (1999)

three teeth, respectively; left and right lacinia mobile with five or four teeth, respectively; accessory setal row with eight to nine setae, some bearing row of minute protuberances. Molar developed, triturative, with plumose seta. Palp articles 1, 2, and 3 in length ratio of 1.0:3.2:2.9, article 1 lacking setae, article 2 with five marginal and eight submarginal setae, and article 3 with a pair of A-setae. Maxilla 1 (Fig. 2, MX1) with inner plate ovate and bearing five apicomedial plumose setae; outer plate rectangular, with 11 serrate, robust setae; palp (Fig. 2, MX1 PLP) two-articulate, longer than outer plate, with nine inner robust setae, six medial slender setae, single outer robust seta, and single outer slender seta. Maxilla 2 (Fig. 2, MX2) with inner plate slightly broader than outer plate, former bearing oblique row of eight setae. Maxilliped (Fig. 2, MXPD) with inner plate (Fig. 2, MXPD ip) nearly reaching base of palp, outer margin of former expanded, with three apical robust setae, but lacking interlocking robust setae; outer plate (Fig. 2, MXPD op) extending to distal margin of palp article 1, with row of minute protuberances along inner margin. Maxillipedal palp four-articulate, long; article 2 heavily setose medially, 2.2 times longer than article 1 and 1.8 times longer than article 3; dactylus half length of article 3.

Coxa 1 (Fig. 1, GN1) with weakly convex ventral margin, two setae on posterior margin; coxa 2 (Fig. 1, GN2) with anteroventral corner projecting, posterior margin with four setae, inner face weakly setose. Coxae 3–4 (Fig. 3, P3, P4) with blunt tip anteroventrally, inner and outer faces weakly setose. Coxa 5 (Fig. 3, P5) wider than long, with weakly setose inner and outer faces. Coxa 6 (Fig. 3, P6) with posterior lobe slightly dominant, inner and outer faces weakly setose. Coxa 7 (Fig. 3, P7) smallest among those of all pereopods.

Gnathopod 1 (Fig. 1, GN1) with inner face of basis setose, outer face with row of robust setae along posterior margin, posterodistal lobe weak, with robust setae;

<i>A. australis</i> Stebbing, 1883	<i>A. charlottae</i> Coleman, 1998	<i>A. comorensis</i> Ledoyer, 1986	<i>A. grevei</i> Barnard, 1961	<i>A. pacifica</i> Gurjanova, 1955	<i>A. septemdentata</i> Ledoyer, 1978	<i>A. spinigera</i> Heller, 1875
absent uniarticulate 9-dentate 6-dentate 1.5	reduced uniarticulate 9-dentate 6-dentate 1.1	absent uniarticulate 7-dentate 3-dentate 1.4	absent 2-articulate ? ? ?	absent uniarticulate ? 5-dentate (?) 1.4	reduced uniarticulate ? ? 1.5	present 2-articulate 7-dentate 6-dentate 0.9
elongate broad developed absent absent ?	ordinary size broad developed absent absent 0.8	ordinary size broad developed absent absent 0.8	ordinary size broad developed absent absent ?	ordinary size broad well developed absent absent 1.0	ordinary size broad reduced absent present 0.9	ordinary size broad reduced present present ?
notched	entire (rounded)	notched	notched	notched	entire (rounded)	notched
Stebbing (1883, 1888); Pirlot (1934)	Coleman (1998)	Ledoyer (1986)	Barnard (1961)	Gurjanova (1955); Barnard (1967)	Ledoyer (1978)	Hiller (1875)

ischium and merus short; carpus 0.6 times as long as propodus, broadly lobate; propodus stout, tapering distally, with long palmar margin, palm lined with 10 robust setae and associated setae; dactylus long, as long as palmar margin, sickle-like, anterior and posterior margins with short setae. Gnathopod 2 (Fig. 1, GN2) with inner face of basis setose, outer face with row of robust setae along posterior margin, posterodistal lobe weak, with robust and slender setae; carpus 0.7 times as long as propodus, ventral lobe broad, with robust setae; propodus stout, palm lined with nine robust setae and associated setae; dactylus long, as long as palmar margin, sickle-like, anterior and posterior margins with short setae.

Pereopod 3 (Fig. 3, P3) with anterior margin of basis bearing many marginal and submarginal setae, outer face with row of robust setae along posterior margin, posterodistal lobe weak, with robust or slender setae; ischium short, as long as wide; merus, carpus, and propodus in length ratio of 1.0:0.6:1.0; dactylus stout, 0.6 times as long as propodus, anteroproximal margin with plumose seta, anterior and posterior margins with setae. Pereopod 4 (Fig. 3, P4) similar to pereopod 3 except for the following points: anterior margin of basis without submarginal setae, posterodistal lobe without robust setae; merus, carpus, and propodus in length ratio of 1.0:0.7:1.0. Pereopod 5 (Fig. 3, P5) with anterior and posterior margins of basis nearly parallel, posterior margin setose, posterodistal lobe weak; merus, carpus, and propodus in length ratio of 1.0:0.6:1.2; dactylus strong, about 0.7 times as long as propodus. Pereopod 6 (Fig. 3, P6) subequal to pereopod 5; basis weakly tapering distally; merus, carpus, and propodus in length ratio of 1.0:0.5:1.0; dactylus length 0.6 times that of propodus. Pereopod 7 (Fig. 3, P7) subequal to pereopod 5; basis with posteroproximal margin expanded; merus, carpus, and propodus in length ratio of 1.0:0.7:1.8. Gills on pereopods 2–7. Brood plates on pereopods 2–5, lacking brood setae due to specimen's not being fully sexually mature.

Pleopods (Fig. 4, PL1) with retinacula of peduncles paired and lacking associated setae, but faces of peduncles setose; inner margin of inner ramus of pleopods 1–3 with two, three, and four clothes-pin setae, respectively.

Uropod 1 (Fig. 4, U1) long, total length 1.7 times urosome length, peduncle 1.1 times as long as inner ramus; dorsolateral and dorsomedial margins of peduncle with 16 and 10 robust setae, respectively, basofacial margin with six slender setae; inner ramus with dorsolateral and dorsomedial margins bearing seven and 11 robust setae, respectively; outer ramus about as long as inner, dorsolateral and dorsomedial margins with 10 and seven robust setae, respectively. Uropod 2 (Fig. 4, U2) with peduncle in 0.8 times length of inner ramus; dorsolateral and dorsomedial margins of peduncle with eight and five robust setae, respectively, basofacial margin with two slender setae; inner ramus with dorsolateral and dorsomedial margins bearing nine and 15 robust setae, respectively; outer ramus 0.8 times as long as inner, dorsolateral and dorsomedial margins with six and nine robust setae, respectively. Uropod 3 (Fig. 4, U3) with peduncle in 0.5 times length of inner ramus; dorsolateral margin of peduncle with six robust setae, dorsomedial margin with three robust and one slender setae; inner ramus with dorsolateral and dorsomedial margins bearing eight and 14 robust setae, respectively; outer ramus 0.8 times as long as inner, dorsolateral and dorsomedial margins with four and seven robust setae, respectively.

Telson (Fig. 1, T) with ventral keel, length 1.3 times width, dorsolateral margins with pair of penicillate setae, distal margin weakly concave and with minute setae.

Etymology. The species name is dedicated to Ms Yoshie Takahashi in recognition of her collection of the specimen.

Remarks. The new species differs from the known species of *Amathillopsis* by the characters listed in Table 1. It is similar to *A. atlantica* Chevreux, 1908, reported from the Azores, the east coast of Greenland, and off Brazil, and to *A. pacifica* with respect to eight of the 12 characters shown in Table 1. However, the new species is distinguished from the latter two species by the absence of the eyes and the greatly reduced posterodistal lobes of basis of both gnathopods. Furthermore, *A. takahashiae* differs from *A. atlantica* in the subequal rami of the uropod 1. In *A. atlantica*, the outer ramus is about 0.8 times as long as the inner ramus. The new species is distinguished from *A. pacifica* by the palp article 3 of the mandible being shorter than article 2, rather than longer than that in *A. pacifica*.

Acknowledgements

We wish to express our sincere thanks to Ms Yoshie Takahashi (Hokkaido University), who kindly gave us the valuable specimen described here. We thank Dr C. O. Coleman (Museum für Naturkunde, Germany), Dr W. Vader (University of Tromsø, Norway), and an anonymous reviewer for useful comments and critical reading of the manuscript. Thanks are also due to Dr M. H. Dick (Hokkaido University) for valuable advice on English. This study was supported in part by a research fellowship for young scientists from the Japan Society for the Promotion of Science (No. 09246) to the first author.

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